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ABSTRACT

A New Zealand study revealed that many secondary school reading tasks are both complex and potentially confusing for pupils. Researchers joined two classes at the junior high and high school levels, and followed the students to their major content area classes--English, math, science, and social studies--for two terms. Conversations with the 60 pupils were tape recorded through 300 lessons. The results highlighted some important areas of confusion as well as some of the complex strategies used by pupils to cope with difficulties. The results indicated "possible worlds" confusion, related to schemata, in which pupils interpret a particular word according to their knowledge of it (i.e., alarm as fire alarm instead of fear). Text materials were frequently too difficult for those pupils who did not really understand the content area, and pictures and diagrams were often of no help. The data also indicated that strategies used by students would change depending on the difficulty of the text or task, such as scanning a text for several answers to a question hoping that at least some of them will be correct, or looking for plausible key words without trying to understand the text at all. Low progress readers often misread unfamiliar words, but the major difficulty was that they read too slowly to keep up with classmates, and read much less frequently. These results call for further research in the areas of "possible worlds" interpretations that do not fit the text, instructional activities to increase reading "mileage," and interviewing techniques to evoke and enhance students' prior knowledge and understanding in content areas. (HTH)

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"You get lost when you gotta blimmin watch the damn words." Another look at reading in the junior secondary school.

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We have just completed a study in New Zealand which revealed that many reading tasks, at the secondary school level, are both complex and potentially confusing for pupils in the classroom.[1] In this paper I want to tell you how the study came about, the rationale for the research design, and the implications of the study in terms of future research and teacher inservice.

How did the study come about?

There were a number of reasons for the study. The initial impetus came from a national seminar of reading advisers in New Zealand. They argued that not enough was known about the state of reading in secondary schools. And they seemed to be right. Other studies had been carried out overseas, in Britain[2] and the U.S.A.[3], where there had been close observation of reading tasks and the teaching of reading in classrooms. Yet these studies had only indicated potential difficulties facing secondary pupils. They had not clarified the nature of these difficulties.

There was also some concern about reading standards. Our national survey data indicated that reading comprehension levels in secondary schools had not changed in fifteen years.[4] They were no worse, but they were no better either, even though considerable funding had been provided for reading programmes at the secondary level.

As a result, the New Zealand Department of Education decided to provide funding to gather baseline data on the kinds of difficulties secondary pupils were having with their texts and other assigned reading materials. They wanted to find out more about the reading demands of the junior secondary school, and how pupils coped with these demands.

What was the design of the study?

The basic basic plan was to get into classrooms and find out what the problems were - by talking to the 'consumers' themselves, the pupils. The design involved focusing on just two classes at third and fourth form levels, and following them for two school terms. A researcher joined each class, and went

with them to their major content area classes - English, Maths, Science and Social Studies. A long term study seemed a good idea for two reasons. First, teachers wanted it that way. They thought it was important to take a developmental perspective. Second, it seemed a realistic way to break down the barriers between the researcher, the pupils and the teachers, and to establish a kind of trust. After all, we were talking about bringing a tape recorder into a teacher's classroom and recording conversations with the pupils during every lesson. The who idea was potentially threatening.

Yet we were able to do this. We tried to be open with the teachers and the pupils from the start. We also said we were interested in pupils, not the teachers. And we were. We did have a special agreement, though, to treat all data as confidential until released by the teachers for public discussion.

Was the sample of pupils representative? I thought so. We had deliberately selected classes in two different schools. There was a wide range of ability in each class. And, although most of the pupils were European, some were Maori, with one Indian and one Cook Islander.

Would there be sufficient data to generalise about pupils reading behaviour? I did not think so. But that was part of the trade-off for focusing on just two classrooms. There were only about 60 pupils in the study, and eight content area teachers. Yet we gathered a lot of data over a wide variety of tasks. In all, some 300 lessons were covered, a total of 18000 minutes of classroom time.

The tough part of the study was to get good interview data. We had two major problems. The first was to avoid asking questions which could subtly change the cognitive process while the interview was taking place. We developed a long checklist of these error categories, and scrutinised each transcript carefully. The second problem was to keep in line with the pupils' thinking. This made the interview process exciting but sometimes frustrating - we talked about 'riding mind waves'. But we developed a set of strategies for hanging on, and I

think we got pretty good at it.

What were the results?

The interview data could not hope to clarify all the reading demands of the content area classrooms, but it did highlight some important areas of confusion, as well as some of the complex strategies used by pupils to cope with difficulties.

1. 'Possible worlds' confusions. I hesitate to use the term 'schema' as a label for these confusions. The reason is that the theory is still emerging, and while it seems to be right, I'm not sure how these data will fit the theory.[5] What we found was that many reading tasks were confusable in some way. There were lots of possible worlds which pupils could construct, and they did. For example, a task in English was this -

Task: Arrange in ascending order ... concern, alarm, horror dread, anxiety, terror, fear.

In this task, the pupil took the task to mean arrange in the order in which things might happen if there was a fire (see Figure 1). The way the pupil did this was complex. At first, I thought ascending was the problem, and that the pupil did not know the meaning. But in fact the pupil seemed to base her 'possible world' on the word alarm. She built a scenario around the idea of a fire alarm, and the events which would follow it. What she did was a good example of something which was common - pupils would use their everyday meanings for words like alarm rather than the special meanings intended. It also illustrated the way in which pupils often build their own 'theories' about tasks and text meanings.

2. Text connections. The text materials assigned to pupils were always too difficult for those pupils who did not really understand the content area. Yet some texts could have been made more explicit, to enable students to teach themselves, to build up their own ideas about topics, using accurate

data from their texts. Summary data, in the form of diagrams, graphs and teacher's notes on a topic, looked easy but were in fact quite difficult. A picture is supposed to be worth a thousand words. And it is, but only if you know the thousand words. Many pupils did not. They liked diagrams, copied them out neatly, coloured them in - but they often could not explain what the diagrams meant (see Figures 2-3).

3. Strategy problems. We found that strategies used by pupils would change, depending on the difficulty of the text or task. Yet some pupils had strategies which they used a lot, and which may be difficult to change. A strategy which we thought particularly worrying was a kind of 'search-and-destroy blitz' technique, where the pupils looked for lots of answers to a question, knowing that some of them, at least, would probably be correct. They thought it was a good strategy, and quite acceptable. After all, their answers were partly correct (see Figures 4-7).

The interesting aspect of the 'Why Go North' example is that it does show how the pupil can very quickly develop a scenario for why people would want to move from the South to the North Island, and then search for words in the text which would fit the scenario, and even adding a few of his own to complete the scenario (for example, 'farmland'). You can actually try out the technique youself by looking for plausible key words without trying to understand the text at all. The 'stock' discussion in the transcript also illustrates the way in which pupils use their everyday meanings to make sense of specialised terms.

4. Reading mileage problems. I think the point is worth making that the low progress readers in our study did not read much. And if it's true that you learn about reading by reading, then these pupils were missing out. We noticed that they often misread words, but then these words were often unfamiliar to them. For example -

Text	Pupil
In Hamlet by Shakespeare ..	In harlot by shaglet...
Potassium permanganate	Permanent gannet
(pi symbol π)	Tee See (T.C.)
Peking	Pecking

Yet a major difficulty for these pupils was that they read slowly and often with difficulty, and often could not keep up with their classmates -

I - Don't you like reading the play?
P - Nope (laughs).
I - Why do you prefer just to listen?
P - Oh, you get lost.
I - Beg your pardon?
P - You get lost when you gotta blimmin' watch the damn words.

And when you compare high and low progress readers in terms of reading 'mileage', the differences are startling -

High Progress
I - How many books would you read a month?
G - Probably about 15 books a month.
I - Good grief. That means you must read one about every two days.
G - Mm. I do. I get books out of the library. I usually get two out at the beginning of the week and another two at the end of the week.
I - You must go to the library a lot.
G - Mm.
I - What library's that?
G - School library.

Low Progress

I- Have you read the novel yet?

P- No, haven't read any book. Only read two books in my life, and that'd be telling the truth.

I- Don't you like reading?

P- Hate it.

Low Progress

I- Do you go to the library much?

P- There's the school library, but kids think you're a bit of a pouf if you go there at lunchtime.

These comments from pupils are only indicators of possible effects of 'reading mileage' differences. Further research will be needed to clarify this factor, keeping in mind that studies of this kind in the secondary school are notoriously difficult. Yet developmental data suggest that this is one factor which distinguishes high and low progress readers right from their first year in school[6]. Even at five years of age, the high progress reader is extremely accurate in everyday classroom reading, is relatively fast, and covers more than four times as many words in texts as do the low progress readers. And these differences would have multiplied considerably by the time of entry to secondary school.

Conclusions

I think that this study has raised some exciting possibilities for future research, and it seems to fit in with current research on the interaction of prior knowledge and text information in reading comprehension.[7,8] Yet at the moment, I feel that the study needs to followed up by more precise research on at least three issues -

First, I think a major stumbling block for many pupils is that their everyday meanings compete with text and task meanings. As a result, they come up with 'possible worlds' interpretations which do not fit the text. There seems a need for more instructional research which will help pupils to arbitrate better between the knowledgewhich they bring to the text, and the text information on the page. Research on this issue is by no means clear.[9] In fact, we have been trying a 'direct hit' approach to increase pupils awareness of their everyday meanings, and the ways in which they use these meanings to make sense of text data. In other words, the pupils are explicitly told about everyday and specialist meanings and shown how they apply to specific content area topics.[10]

A second area of difficulty, especially for low progress readers, is in terms of reading 'mileage'. We need to research instructional activities which will give a dramatic increase to the amount of reading material covered by 'low mileage' pupils, as well as boost their speed and accuracy. We have been trying out activities which simulate the behaviours of high progress readers by giving access to accurate information as well as the opportunity to self-correct. For example, we have started to research the effects of activities such as 'spot the mistake' which encourage pupils to develop an awareness of incongruency in text material.[11] Read-along activities, using tape cassettes, may also help low progress readers to cover lots more print information across the content areas, and help facilitate 'schema build-up'.

My final point is also the one which I think is most important. I see great value in content area teachers learning to use interview techniques as a supplement to their usual ways of probing pupil understanding, such as questions, written reports and so on. The problem is that this style of interviewing is not as easy as it seems. Teachers need to be trained and coached in interviewing, and their interview data need to be criticised and analysed.[12]

Yet it seems worth the effort. Interview data can be insightful, and will sometimes provide information about the complexity of reading tasks and pupil strategies which other techniques do not. Just as there is a need for careful observation of the reading behaviour of younger pupils, I think there is a similar need in the secondary school. And this idea has important implications for inservice. As one reading teacher put it to me, "the first step is for teachers to find out for themselves what is not going on in the classroom."

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Transcript

P - Oh, the alarm would go first, if there was anything wrong, say a fire or something, and then there'd probably be terror and fear, of what's going to happen, and anxiety of what's happening.
I - Mm
P - Then it's gonna be, gonna be the terror and the fear of, knowing what's going to happen to them if they get stuck or something.
I - So when you're ordering it, what are you thinking of in your head as you're ordering it?
P - Just sort of, what I'd do if I was there, what would I think first, when the alarm sounded. I'd wonder what it would sound for, it's a fire or something...
I - So you're thinking of ..
P - Yeah.
I - The order in which you'd do things.
P - Yeah.
I - Or feel things ..
P - If I was there, yeah. Then I'd put the horror of the dead and dread, and horror of the dead people ...
I - And that's the task you've been asked to do?
P - Mm.
I - Arrange in ascending order.
P - Yep.

Figure 1 An example of a possible worlds type of confusion, where the pupil constructs a possible meaning for the task, based around the everyday meaning of 'alarm', as in a fire alarm.

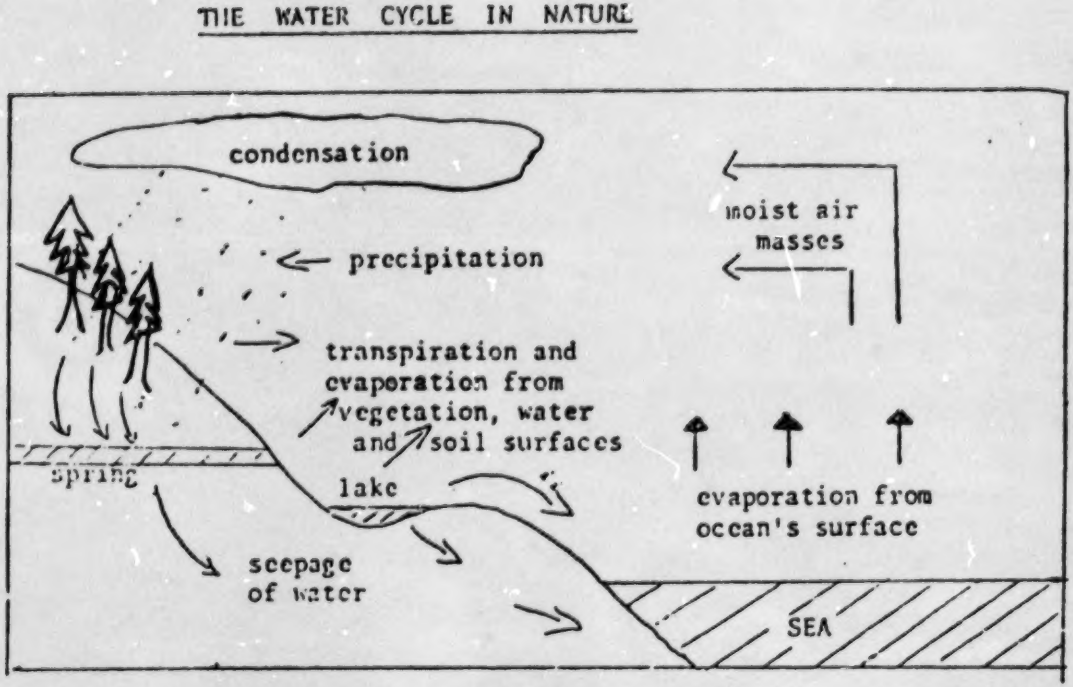

Figure 2 An example of a diagram, taken from a Social Studies task, which seemed to be simple, yet which was in fact very confusing for some pupils (see transcript in Figure 3).

Transcript

I - What bit don't you understand?

P - Where, um...where the rain goes down to the trees. Where does it go then, well what does it do?

I - Is there nothing on that diagram that will show you? (pause). Can you see anything on the diagram that will help you to work out where the water goes?

P - The lake. It must go down into the lake.

I - All right. If it goes down into the lake, what happens then?

P - Well then, it must overflow and go down into the sea.

I - What is it that's got you puzzled?

P - The bit where it says evaporation from ocean's surface.

I - How is this puzzling you?

P - Cause I don't know where it goes.

I - You don't know where it goes? There's nothing on the diagram that would help you?

P - The top bit.

I - What does the top bit say?

P - Moist air mm... Whatever that word is.

I - Masses.

P - Mm.

I - What does that mean to you?

P - Well it must rise to the air and go to the other side.

I - And what happens to it when it gets to the other side?

P - Goes in the clouds I suppose. Something happens to the clouds.

I - You stuck again?

P - Mm.

I - What are you stuck on this time.

P - The cloud bit.

Figure 3 An example of a text connections confusion, where the pupil had difficulty in linking ideas within the diagram.

Why Go North?

A warmer climate is often assumed to be the main reason for the northward drift, and a recent survey of secondary school pupils showed that they at least preferred the warmer northern parts of New Zealand to live. Even small towns like Kaitaia were more popular than Dunedin or Invercargil. However, for adults, the decider is seldom the climate.

Typical of the sort of person Dunedin is losing to Auckland is 24-year-old Garth Dever, a Dunedin-born and educated dentist who now works for the Auckland Hospital Board. Auckland provides him with the wealth of clinical material he wants before he goes on to post graduate studies. He plans to go to Canada for further experience and study, but when he comes back, he won't settle in Dunedin.

"It is too dead. It is not progressing, and if I can get the sort of post-graduate qualifications I am aiming for, there won't be room for me to practice there."

He finds it more expensive to live in Auckland, and he misses his favourite sport of mountaineering, but job considerations outweigh these.

Job experience is also the reason for 25-year-old Eion Edgar moving north from his home in Dunedin. Eion, who is a B.Comm. graduate from the University of Otago, has joined an Auckland firm of stock-brokers, and is gaining experience he says he just could not find elsewhere. He is earning less than he could in other centres, but the job is more important.

A greater number of jobs in the north means a greater number of openings for promotion, and this was the reason Bob McGilvray, a customs control officer, moved from Mosgiel to Auckland. He had been happy living in Mosgiel but his career was his first consideration.

Better money was not generally a reason for moving north, but one person who found a wage which would draw anyone was 34 year old watersider Bill Sykes. He moved up 2 years ago, and is earning more than twice as much as he did in his former job in Dunedin.

Figure 4 The text which pupils were asked to read in a Social Studies lesson, where the task was to "Find reasons in the text which explain why people move from the South Island to the North Island." (See also Figures 5-7).

Figure 5 A map to help explain the locations of some of the cities mentioned in the text in Figure 4 (Note that the pupils had no map. It was probably assumed they would have prior knowledge of these locations).

II Movement of people in New Zealand

Some of the reason why people
like to come to South Island is

1 climate
2 farm land
3 job offering
4 pale expensive
5 retiring

6 birthdat
7 more active
8 qualification
9 expensive
10 more to earning

11 start
12 earning more
13 career
14 formation

Figure 6 Pupil's answers to the question "Find reasons in the text which explain why people move from the South Island to the North Island."

Transcript

I - You've got 'more alive' there. What did you mean by that?

P - Well, it said Dunedin and all those sort of places, it's pretty dead, but over in Ham-, ah, over in North Island, you got skiing, you got rollerskating, you got disc- more discos and that sort of stuff. It's more alive.

I - Where did it actually say that? Is it in that article?

P - Yeah, it says here...where is it...ah...It was too dead in Dunedin...In South Island 'there was not enough progressive' y'know, it was too dead. So it's more alive in North Island.

I - Yeah, I see what you mean now.

P - Qualifications.

I - Qualifications.

P - And more stock handling y'know, getting more experience with stock. Um.

I - Was that in the article?

P - Yeah, it was - ah, where is it...stock (searching the text)...somewhere down here...about a guy who became a stock agent, he reckoned...you learned more about stock than you did down in the South Island...here you are, "Stock broker."

Figure 7 An example of what seems to be a strategy where there is a 'search and destroy blitz' on the text, the pupil trying to find as many plausible answers as possible, based on a 'possible worlds' confusion about the meaning of the text.